

# Langara College – Fiscal 2009 Carbon Neutral Action Report

## Executive Summary

Langara College has been working at reducing green house gases for many years beginning with the incentive programs developed by BC Hydro and subsequently with programs developed through the Office of Energy Efficiency, Natural Resources Canada and the Association of Canadian Community Colleges. Langara College has been updating their Energy Management Action Plan for the Canadian GHG Challenge Registry, formerly the Voluntary Climate Registry (VCR) Inc., annually and has been recognized as a Gold Champion Level Reporter since 1999".

In recent years Langara has completed two major construction and renovation projects both built to LEED gold standard utilizing many innovative energy conserving construction features and a geo-exchange mechanical design. Upgrades to the existing mechanical systems in the older buildings are being done to improve energy efficiency and reduce green house gases throughout the college building stock.



As part of the college's commitment to reducing Green House Gas (GHG) Emissions, an Environmental Responsibility Policy (No A1011) was established in June 2001. The purpose of the board governance policy is as follows:

To provide direction to the College regarding the creation of a learning and working environment characterized by social responsibility, the Board is committed to:

- protecting and enhancing the environment for future generations, and
- using and managing its own physical environment in ways that lead to sustainability

## Actions Taken to Reduce Greenhouse Gas Emissions in Fiscal Year 2009

The following are highlights of actions taken in fiscal year 2009 to reduce Greenhouse Gas Emissions.

- An Energy Manager, through BC Hydro's Energy Manger program, was hired.
- A Sustainability Website was developed.
- Building controls were upgraded in A&B buildings, including new zone valves and software version upgrades.
- The newly renovated C Building and new Langara Students' Union building opened, these building include a novel geo-exchange system and exhaust heat recovery.
- Preliminary investigations for campus wide energy sub metering were carried out. Sub meters will be installed in 2010.
- Obtained approval for BC Hydro's Continuous Optimization program – through this program Langara will setup real time energy use information for all buildings on campus and use this information to optimize control of buildings.
- Carried out energy savings assessments for various lighting retrofits and controls on campus to determine feasibility.
- Awareness Campaign related to Alternative transportation to campus, including U-pass program.

## Operational Changes

- The newly renovated C Building and new Langara Students' Union building increases the Campus area over the previous year.
- The number of full time equivalents (FTE) has increased 5% over the previous year.

## **Plans to Continue Reducing Greenhouse Gas Emissions 2010-2012**

The following actions are currently included in the Langara's Strategic Energy Management Action Plan:

- 2010: Install sub metering and energy management information systems (EMIS).
- 2010: Finalize commissioning of C Building.
- 2010: Implement various lighting retrofits and controls strategies.
- 2010: Evaluate campus wide computer management software options and install.
- 2010: Campus wide Energy Awareness Campaign, including special events for 40th year anniversary.
- 2010-2011: Carry out Continuous Optimization investigation phase and implement projects with <2 yr payback.
- 2010-2011: Evaluate new heating plant alternatives.
- 2010-2012: Develop various operational guidelines related to campus energy management, green purchasing, waste management etc.

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## Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*.

Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
<b>Mobile Fuel Combustion (Fleet and other mobile equipment)</b>							
<b>Vehicle fuel efficiency</b>							
Replace vehicles with more fuel-efficient models	Complete	0	% of vehicles are fuel- efficient models	limited usage, only two vehicles, one propane truck and one grounds vehicle can not justify vehicle replacement			
<b>Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)</b>							
<b>Planning/management</b>							
Enrol in a building energy benchmarking program (e.g., GREEN UP)	In Development			carried out internal benchmarking of campus buildings post construction of new buildings	will investigate benchmarking programs for performance comparison	2009	No End Date (Continuous)
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	0	% of buildings have a real time metering system installed	campus submetering topology investigations, funding approved for metering installations	install submeters, integrate into energy management system	2009	2010
<b>Owned buildings</b>							
Establish energy performance baseline for owned buildings	Ongoing/In Progress	0	% of owned buildings have an established energy performance baseline	Langara currently uses a campus level baseline. Baseline adjustments were made to old baseline to account for new buildings. New submetering will help establish building level benchmarking	use submeter data to establish baselines	2009	No End Date (Continuous)
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress			Two new buildings designed to LEED Gold, registration ongoing	continue to pursue certification	2005	No End Date (Continuous)
Incorporate integrated design process into new construction or during renovations of owned buildings	Complete	100	% of buildings built or renovated since start year indicated used the integrated design process	guideline established earlier		2005	No End Date (Continuous)
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	In Development			Chiller plant upgrade	Create inventory of fugitive emissions	2009	No End Date (Continuous)
Complete energy retrofits on existing, owned buildings	Ongoing/In Progress	100	% of owned buildings have undergone energy retrofits since start year indicated	chiller plant upgrade, new zone valves, controls upgrade, completion of major renovation of C Bldg and New Langara Student Union Building - now uses geo-exchange system for heating and cooling.	Controls Optimization Campus wide - Approved for BC Hydro COP program, A and B Lighting upgrade with energy savings T8s and new ballasts, various lighting controls.... See Strategic Energy Management Plan	2000	No End Date (Continuous)
<b>Retrofitting owned buildings</b>							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	100	% of retrofits (captured above) had heating, cooling, and ventilation systems upgrades	A Builidng Zone valve upgrades	Heating Plant evaluation-consider use of excess geo-exchange capacity, review options for AHU replacements for future.	2000	No End Date (Continuous)

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Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Upgrade lighting systems during retrofits	Ongoing/In Progress	100	% of retrofits (captured above) had lighting systems upgrades	efficient lighting standards considered for all renovations, including occupancy controls	A and B Lighting upgrade with energy savings T8s and new ballasts, various lighting controls.	2000	No End Date (Continuous)
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	100	% of retrofits (captured above) had control system upgrades or adjustments	B Building Controls upgrade	Controls Optimization Campus wide - Approved for BC Hydro COP program	2009	2011
Improve building insulation (including windows) during retrofits	Ongoing/In Progress	98	% of retrofits (captured above) had insulation improvements	C Building major renovation included new insulation.	Small area left on basement level ... no plan to date	2005	No End Date (Continuous)
Install an on-site renewable energy demonstration project	Ongoing/In Progress			Renovated C Bldg and New LSU opened, uses a novel geo-exchange heating and cooling system (Thermenex).	complete commissioning of building and include interactive display.	2005	No End Date (Continuous)
<b>IT power management</b>							
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	60	% of computers shut down automatically outside of regular business hours	labs currently shutdown at night around 10:30pm (ongoing since 2005). Met with power management providers to evaluate other software options.	Evaluate software options and build business case.	2005	2010
Implement server virtualization	Ongoing/In Progress	60	% of servers have been virtualized since start year indicated	on going upgrades as needed for capacity	continue to virtualize servers, including addition of blade servers	2006	No End Date (Continuous)
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress	80	% of computers have auto-sleep settings applied	evaluating power management software, existing operating systems had issues with these functions	included in power management software evaluation	2009	2010
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress	20	% reduction in printers, copiers, and/or fax machines since start year indicated	tender developed	Issue and award tender, evaluate savings	2009	2010
Apply auto-sleep settings on printers, copiers, fax machines, and/or multi-function devices	Ongoing/In Progress	80	% of devices have auto-sleep settings applied	many copiers shut off at night	Issue and award tender, evaluate savings, new software will enable this to be centrally managed.	2009	2010
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	70	% of computers are ENERGY STAR rated	ongoing	ongoing - replace old computers as required	2006	No End Date (Continuous)
<b>Appliances and electronic devices</b>							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress	60	% of fridges are ENERGY STAR rated	ongoing	formalize guidelines for purchasing	2010	2011
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			ongoing	formalize guidelines for purchasing	2010	2011
Replace desk lamp incandescent bulbs with compact fluorescent (CFL) bulbs or source more efficient desk lamps for future purchases	Ongoing/In Progress			ongoing	formalize guidelines for purchasing	2010	2011
<b>Behaviour change program</b>							
Help staff reduce personal energy use through "workstation tune-ups"	In Development			research and inquiries into available tools	incorporate into an awareness campaign	2010	2011
Ask staff to unplug electrical equipment or switch off power bars when not in use	In Development			research power bar options for this	incorporate into an awareness campaign	2010	2011

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Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)		Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress			general awareness campaign development	incorporate into an awareness campaign	2005	2011
Provide tips to staff on saving energy in the office while working outside of regular business hours	Ongoing/In Progress			bi-weekly tip included in staff new letter and on facebook.	incorporate into awareness campaign	2005	2011
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress			general awareness campaign development	incorporate into an awareness campaign	2005	2011
Promote hot water conservation	In Development			general awareness campaign development	incorporate into an awareness campaign	2010	2011
<b>Supplies (Paper)</b>							
<b>Paper Type</b>							
Purchase 30% post-consumer recycled paper	Ongoing/In Progress			establish current baseline	evaluate areas where more recycled products can be used	2008	2011
Purchase 100% post-consumer recycled paper	In Development			none	evaluate areas where more recycled products can be used	2009	2011
<b>Printer/document settings</b>							
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	10	% of network printers or photocopiers are set to automatic double-sided	printer tender will allow for this to be centrally managed	Issue and award tender, manage settings	2009	2010
Apply "print and hold" settings to networked printers to eliminate unclaimed print jobs	Ongoing/In Progress	30	% of network printers have 'print and hold' settings applied	used for students and faculty shared printing	on-going	2000	No End Date (Continuous)
<b>Electronic media in place of paper</b>							
Use electronic document library for filing common documents	Ongoing/In Progress			on going scanning - Contact Records Manager	continue to scan documents, raise awareness and refine processes.	2008	No End Date (Continuous)
Post materials online that were previously printed	Ongoing/In Progress			many forms now online rather than photocopying	raise awareness and provide training and tools, develop operating guidelines	2005	No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	Complete			no paper pay stubs		2005	No End Date (Continuous)
<b>Behaviour change program</b>							
Encourage re-use of scrap paper	In Development			none	investigate methods for increased reusing of scrap paper on campus	2009	2012
<b>Other Paper Supplies Actions</b>							
Course Ware materials online....	In Development			none	survey to understand acceptance of electronic versions	2010	2012

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## Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the *Greenhouse Gas Reduction Targets Act*. Public sector organizations can optionally use this section to report on actions that will help British Columbia meet its provincial greenhouse gas reduction targets, engage the public, and improve environmental sustainability across all aspects of their organization.

Action	Status (as of 12/31/09)	Performance to Date (as of 12/31/09)	Steps Taken in 2009	Steps Planned for 2010 -2012	Start Year	End Year
<b>Education, Awareness, and Engagement</b>						
<b>Team-building</b>						
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	Ongoing/In Progress		Hired Energy Manager, development of energy management plan including identification of energy saving measures	Regular energy management team meetings, incorporate GHGs in energy plan.	2009	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		Energy Manager dedicated to program	Get commitment from other team/areas of the college to commit time to Energy and GHG mandate	2009	2009
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress		Energy Manager dedicated to program	Get commitment from other team/areas of the college to commit time to Energy and GHG mandate	2009	No End Date (Continuous)
<b>Staff Professional Development</b>						
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress		many employee workshops and professional development courses, subjects included: 100 mile diet, composting, How can we make the campus more green?, environmental responsibility, for the health of it, safe biking, etc.	continue to offer similar courses.	2009	No End Date (Continuous)
<b>Staff awareness/education</b>						
Provide education to staff about the conservation of water, energy, and raw materials	In Development		General Awareness Campaign development	incorporate into an awareness campaign	2009	No End Date (Continuous)
Provide green tips on staff website or in newsletters	Ongoing/In Progress		bi weekly energy tip in employee newsletter, new sustainability website	continue with tips, additional awareness activities	2005	No End Date (Continuous)
<b>Client/public awareness/education</b>						
Provide green tips on client/public website or in newsletters	Ongoing/In Progress		new sustainability website	continue with regular updates to the website	2009	No End Date (Continuous)
<b>Other Sustainability Actions</b>						
<b>Water conservation</b>						
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Ongoing/In Progress		general maintenance with low flush models, waterless urinals, motion activated sinks	determine baseline, carryout water audit on campus	2010	2011
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	In Development		New buildings consider stormwater management	formalize poilicy	2005	2012
<b>Waste reduction/diversion</b>						
Put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	In Development		ongoing recycling and composting	Tendering this year, formalize policy, addition of recycling areas, improve signage	2005	2012
<b>Procurement (non-paper supplies)</b>						

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Incorporate minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)	In Development			computers are recycled	policy development	2007	No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Complete			Implemented green cleaning products, procurement of biodegradable cafeteria take away containers.		2009	2009
<b>Building construction, renovation, and leasing</b>							
Establish a policy to reuse materials where possible and divert construction and demolition debris from landfills and incineration facilities	Ongoing/In Progress			New buildngs designed to LEED Gold, renovation bin available to sort waste.	formalize college operations guidelines	2010	2012
Incorporate lifecycle costing into new construction or renovations	Ongoing/In Progress	30	% of business cases incorporating lifecycle costing since start year indicated	New buildings and major renovations include C Building	formalize college operations guidelines	2005	2012
<b>Indoor air quality</b>							
Enforce a scent-free policy (e.g., no strong perfumes, deodorants, etc.)	In Development			signs posted throughout the college	formalize college operations guidelines	2009	No End Date (Continuous)
Incorporate low volatile organic compounds (VOCs) standards into procurement policy for products such as paints, carpets, and furniture	Ongoing/In Progress			All plywood - formaldehyde free, all paint - low VOC	formalize college operations guidelines	2005	2012
<b>Commuting to and from home</b>							
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress			bike to work week. EPP awareness. Umbrella loan. Bike rack expansion	covered bicycle parking. Program awareness. Workshops seminars	2005	No End Date (Continuous)
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Complete			available with completion of new library building in 2007		2007	2009
Provide secure bicycle storage	Complete			available with completion of new library building in 2007		2007	2009
Modify parking fees or parking availability for staff/students	Ongoing/In Progress	5	designated carpool parking area	new parking meters, fee increase to align with mass transportation costs	20% rate increase from May	2005	No End Date (Continuous)